
Introduction

Photon Engineering makes every possible effort to have regular releases which provide significant feature and usability enhancements to FRED. The purpose of this document is to convey the most recent features added to FRED in the last release and describe both their utility and implementation with reference to any examples which demonstrate their use.

New Features

Dashboard and Pinned Files

When starting FRED, a new interface is displayed that provides quick access to program features and resources. Along with the quick start, help resources and licensing buttons, a new concept called Pinned Files is included. Pinned Files are FRED documents and scripts that can be specially tagged by the user to be pinned to the Dashboard and opened with a single click. This concept of Pinned Files can be useful for resources which are accessed repeatedly over extended periods.

Source Acceptance Filter

Under certain configurations, the description of an illumination source's radiance may lead to inefficient sampling of the aperture(s) of an optical system. Consider, for example, an LED source with a non-trivial intensity distribution located away from the optical axis of a system containing one or more small entrance apertures. In such a scenario only a small fraction of the rays generated by the hemispherically emitting source would actually enter the optical system, resulting in a large computational inefficiency. With Acceptance Filters, the emission regions of interest (the optical system entrance apertures) can be specified and the source will only generate rays into the Acceptance Regions. Furthermore, the radiometric correctness is preserved so that the appropriate amount of power flows through the designated Acceptance Regions.

Element Primitives

Eleven new Element Primitive geometry types have been added to help facilitate rapid model construction. The new primitives are: N-Sided Plane, N-Sided Extruded Solid, N-

Sided Extruded Surface, N-Sided Pyramid Solid, N-Sided Pipe, Plane with N-Sided Hole, Cylinder Surface, Hemisphere Surface, Beveled Wedge, Multi-mode Fiber Optic, and Ideal Lens.

Analysis Surface Construction

Analysis Surfaces can now be easily created in a single step by right mouse clicking on a source node, geometry surface node, or Detector Entity node and choosing the option, “Auto Create and Attach Analysis Surface”. The new Analysis Surface is generated with the correct location and ray selection criteria and is immediately available for use with analyses functions.

Miscellaneous Updates and Bug Fixes

In addition to the major new improvements described above, this release contains many smaller feature additions and bug fixes. Please refer to the Release Notes found on FRED’s Help menu for a complete listing of all enhancements and defect resolutions.

New Script Commands

The following script commands have been added or modified for this release:

Script Command	Description/Modification
SetDiffractEfficiencyVolHOEAlgorithm	Specifies the parameters of a primary volume HOE Algorithm efficiency specification
GetDiffractEfficiencyVolHOEAlgorithm	Retrieves the parameters of a primary volume HOE Algorithm efficiency specification
SetDiffractEfficiencyVolHOEAlgorithmSecondary	Specifies the parameters of a secondary volume HOE Algorithm efficiency specification
GetDiffractEfficiencyVolHOEAlgorithmSecondary	Retrieves the parameters of a secondary volume HOE Algorithm efficiency specification
SetAcceptanceFilterActiveFlag	Sets the Active flag state for the Acceptance Filter settings of a designated source node
IsAcceptanceFilterActive	Queries a source node and returns the state of its Acceptance Filter flag
AddSrcAcceptanceRegion	Adds a new Acceptance Filter region to a source node and returns the index number of the Acceptance Filter that was added
SetSrcNthAcceptanceRegion	Updates the parameters of an existing Acceptance Filter region of a source

Script Command	Description/Modification
GetSrcNthAcceptanceRegion	Retrieves the parameters of the N'th Acceptance Filter region from a designated source and stores them in a T_ACCEPTANCE_FILTER data structure
DeleteSrcNthAcceptanceRegion	Deletes the N'th Acceptance Filter region from a source node
InitAcceptanceFilter	Initializes the members of a T_ACCEPTANCE_FILTER data structure to default values
GetSrcAcceptanceRegionCount	Queries a source node for the number of Acceptance Filter regions defined
ElemAddCylinder	Adds a new Cylinder type element primitive
ElemAddHemisphereSurface	Adds a Hemisphere Surface type element primitive
ElemAddN-sidedExtrudedSolid	Adds an N-sided Extruded Solid type element primitive
ElemAddN-sidedExtrudedSurface	Adds an N-sided Extruded Surface type element primitive
ElemAddN-sidedPipe	Adds an N-sided Pipe type element primitive
ElemAddN-sidedPlane	Adds an N-sided Plane type element primitive
ElemAddN-sidedPyramidSolid	Adds an N-sided Pyramid Solid type element primitive
ElemAddPlaneWithN-sidedHole	Adds a Plane with N-sided Hole type element primitive
ElemAddBeveledWedge	Adds a Beveled Wedge type element primitive
ElemAddIdealLens	Adds an Ideal Lens type element primitive
ElemAddMultimodeFiberOptic	Adds a Multimode Fiber Optic type element primitive
ImpSampGetDirectionSampleType	Queries an importance sample specification of a surface for the type of directional sampling being used
ImpSampSetDirectionSampleType	Sets the type of directional sampling being used by an importance sample specification of a surface